

REMARKS

Initially, Applicant would like to express appreciation to the Examiner for the detailed Official Action provided.

Upon entry of the above amendment, claims 1 and 5 will have been amended; and claims 2 and 3 will have been canceled. Accordingly, claims 1, 5, and 6 are currently pending. Applicant respectfully requests reconsideration of the outstanding rejection and allowance of claims 1, 5, and 6 in the present application. Such action is respectfully requested and is now believed to be appropriate and proper.

Claims 1-3, 5, and 6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over MCKENNA (U.S. Patent No. 1,438,54) in view of KOMENDOWSKI (U.S. Patent No. 3,485,123), PARMLEY ("Illustrated Sourcebook of Mechanical Components"), and AIHARA (U.S. Patent No. 5,771,765).

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Although Applicant does not necessarily agree with the Examiner's rejections of claim 1 on this ground, nevertheless, Applicant has amended independent claim 1 to clearly obviate the above noted ground of rejection in order to expedite prosecution of the present application. In this regard, Applicant notes that MCKENNA, KOMENDOWSKI, PARMLEY, and AIHARA fail to teach or suggest the subject matter claimed in amended claim 1. Further, MCKENNA, KOMENDOWSKI, PARMLEY, AIHARA, WHISLER, and EVANS also fail to teach or suggest the subject matter claimed in amended claim 1. In particular, claim 1, as amended, sets forth a chip removing device in

a band saw including, inter alia, a pair of brush support bodies pivotally supporting a pair of brush shafts having a pair of rotationally driven brushes; a driving mechanism with a drive motor that rotationally drives the brush shafts; a removing biasing unit that biases the pair of brush support bodies; “a wear detector that detects a reduction in diameter of the brush caused by wear”, each of brush support bodies and the brush shafts rock in directions approaching and separating from the band saw blade; the pair of brush shafts are inclined forwardly and downwardly; and wherein “the wear detector comprises: a pair of pushing levers extending from the pair of brush support bodies toward the band saw blade; a sensor to detect the wear of the band saw blade; a shaft to be detected which can be engaged with each of the pushing levers and which can be reciprocated so as to approach the sensor and to be moved away from the sensor; and a detecting biasing unit biasing always the shaft to be detected so that the shaft to be detected is moved away from the sensor and is brought into abutment against the pushing levers, wherein when one or both of the pair of brushes is worn to their using limit, the one or both of the pair of brushes being moved toward the band saw blade by the removing biasing unit and one or both of the pair of pushing levers being engaged with the shaft to be detected, thereby the shaft to be detected is pushed by the pushing levers so as to approach the sensor then the wear for the using limit of the one or both of the pair of brushes can be detected”.

This amendment is fully supported by the specification, including the claims and drawings, and no prohibited new matter has been added.

Applicant's claimed chip removing device for a band saw blade includes a pair of brush support bodies pivotally supporting a pair of brush shafts having a pair of rotationally driven brushes; a driving mechanism that rotationally drives the brush shafts; a removing biasing unit that biases the pair of brush support bodies; the pair of brush shafts are inclined forwardly and downwardly; and a

wear detector that detects a reduction in diameter of the brush caused by wear. The wear detector includes a pair of pushing levers 93, 93 extending from the pair of brush support bodies 61A, 61B toward the band saw blade 23U; a sensor 71 that detects the wear of the band saw blade; a shaft 81 to be detected which can be engaged with each of the pushing levers 93, 93 and which can be reciprocated so as to approach the sensor 71 and to be moved away from the sensor 71; and a detecting biasing unit 79, 85 always biasing the shaft 81 to be detected so that the shaft 81 to be detected is moved away from the sensor 71 and is brought into abutment against the pushing levers 93, 93. When one or both of the pair of brushes 57A, 57B is worn to the using limit, the one or both of the pair of brushes 57A, 57B is moved toward the band saw blade 23U by the removing biasing unit and one or both of the pair of pushing levers 93, 93 is engaged with the shaft 81 to be detected. Accordingly, the shaft 81 to be detected is pushed by the pushing levers 93, 93 and approaches the sensor 71, thus detecting the using limit of the one or both of the pair of brushes. See particularly figure 17 and paragraphs [0054] – [0056] of the instant specification.

The configuration of the wear detector as described above provides the following structure, operation, and advantages not shown in the prior art. In this regard, when one or both of the brushes are worn, the brush(es) move toward the band saw blade by the biasing force of the tension spring 69, and at the same time, the set screw 95 engaged with the dog engaging portion 81D of the shaft 81 to be detected pushes the shaft 81. Further, the position of the sensor 71 is set such that the gap between the shaft 81 to be detected and the proximity sensor 71 comes into the detection range when one or both of the brushes are worn to the using limit. Accordingly, the timing of the replacement of the brushes is automatically detected.

Therefore, in view of the above detailed description of the claimed invention, it is a feature of the present invention that the chip removing device includes a pair of brushes and a wear detector, as

claimed in amended claim 1. Further, it is an additional feature of the present invention that the wear detector *detects the wear in each of the brushes*. The detector detects the wear in *each* of the pair of brushes *independently*, even when *one or both* of the brushes are worn to the using limit. Accordingly, the wear detector of the present invention *detects the wear even in a case when only one of the brushes is independently worn to its using limit, while the other brush is not worn to its using limit*.

In accordance with the above described features of the present invention, *when only one of the brushes is worn to its using limit, the sensor detects that only one of the brushes is worn to its using limit*.

Therefore, according to the present invention, when the wear detector detects that only one of the brushes is worn to its using limit, then only the brush that is worn to its limit (i.e., only one brush) should be replaced by a new brush. Thus, the brush that is not worn should not be replaced. Accordingly, waste is avoided and costs are reduced, since an unworn brush will not be needlessly replaced.

The MCKENNA reference discloses a device including a pair of brushes for cleaning a saw blade. The KOMENDOWSKI reference discloses a device including brushes on the sides of the blade. As recognized by the Examiner, MCKENNA, KOMENDOWSKI, and PARMLEY fail to teach or suggest a wear detector.

The AIHARA reference discloses a wear detector including elements 111, 117 that detect wear on the brush. However, the AIRHARA device fails to teach or suggest a wear detector including a pair of pushing levers, a sensor, a shaft to be detected, and a detecting biasing unit, as claimed in amended claim 1. Further, AIHARA also fails to teach or suggest a wear detector that detects when *one or both* of a pair of brushes is worn to its using limit, as claimed in amended claim

1. In this regard, AIHARA discloses a wear detector for one brush. This wear detector includes the “shaft” (the circle). As clearly shown in the figures, the “shaft” could necessarily operate *only* on one wear detector. Thus, even if a wear detector of AIHARA were provided on each side of a blade, there would necessarily be two shafts. Therefore, even if the wear detector of AIHARA were to be provided on both sides of the blade, the device would not include “a shaft to be detected which can be engaged with each of the pushing levers and which can be reciprocated so as to approach the sensor and to be moved away from the sensor”. In this regard, the device would include two shafts and would not include a shaft that engages with *each* of the pushing levers, as claimed. Accordingly, even if the wear detector of AIHARA (for detecting wear in only one brush) could be applied to the MCKENNA and KOMENDOWSKI devices, the resulting combination still would not include the particular structural elements that provide that wear on *one or both* of a pair of brushes is detected, as in amended claim 1.

Additionally, as recognized by the Examiner, WHISLER and EVANS also fail to teach or suggest a wear detector including a pair of pushing levers, a sensor, a shaft to be detected, and a detecting biasing unit, as claimed in amended claim 1. Further, WHISLER and EVANS also fail to teach or suggest a wear detector that detects when *one or both* of a pair of brushes is worn to its using limit, as claimed in amended claim 1.

Therefore, KOMENDOWSKI, PARMLEY, AIHARA, WHISLER, and EVANS fail to cure the deficiencies of the MCKENNA device, and even assuming, arguendo, that the teachings of MCKENNA, KOMENDOWSKI, PARMLEY, AIHARA, WHISLER, and EVANS have been properly combined, Applicant’s claimed chip removing device including a wear detector would not have resulted from the combined teachings thereof.

Further, there is nothing in the cited prior art that would lead one of ordinary skill in the art to make the modification suggested by the Examiner in the rejection of claim 1 under 35 U.S.C. § 103(a) over MCKENNA in view of KOMENDOWSKI, PARMLEY, AIHARA, WHISLER, and EVANS. Thus, the only reason to combine the teachings of MCKENNA, KOMENDOWSKI, PARMLEY, AIHARA, WHISLER, and EVANS results from a review of Applicant's disclosure and the application of impermissible hindsight. Accordingly, the rejection of claim 1 under 35 U.S.C. § 103(a) over MCKENNA in view of KOMENDOWSKI, PARMLEY, and AIHARA, and the rejection of claim 1 under 35 U.S.C. § 103(a) over MCKENNA in view of KOMENDOWSKI, PARMLEY, AIHARA, WHISLER, and EVANS are improper for all the above reasons and withdrawal thereof is respectfully requested.

Applicant submits that dependent claims 5 and 6, which are at least patentable due to their dependency from claim 1 for the reasons noted above, recite additional features of the invention and are also separately patentable over the prior art of record based on the additionally recited features.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection, and an early indication of the allowance of claims 1, 5, and 6.

SUMMARY AND CONCLUSION

In view of the foregoing, it is submitted that the present amendment is proper and that none of the references of record, considered alone or in any proper combination thereof, anticipate or render obvious Applicant's invention as recited in claims 1, 5, and 6. The applied references of record have been discussed and distinguished, while significant claimed features of the present invention have been pointed out.

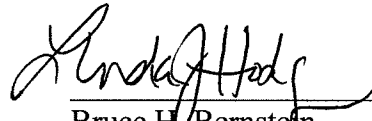
Accordingly, consideration of the present amendment, reconsideration of the outstanding Official Action, and allowance of the present amendment and all of the claims therein are respectfully requested and now believed to be appropriate.

Applicant has made a sincere effort to place the present application in condition for allowance and believes that he has now done so.

Any amendments to the claims which have been made in this amendment, which do not narrow the scope of the claims, and which have not been specifically noted to overcome a rejection based upon the prior art, should be considered cosmetic in nature, and to have been made for a purpose unrelated to patentability, and no estoppel should be deemed to attach thereto.

Should there be any questions, the Examiner is invited to contact the undersigned at the below listed number.

Respectfully submitted,
Minoru GOTO


Linda J. Hodge
Reg. No. 47,343
Bruce H. Bernstein
Reg. No. 29,027

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GREENBLUM & BERNSTEIN, P.L.C.
1950 Roland Clarke Place
Reston, Virginia 20191
(703) 716-1191